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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,362	06/28/2004	Thomas Hasskerl	253629US0PCT	7615
22850 7590 08/13/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER ROBINSON, ELIZABETH A				
ART UNIT 1794		PAPER NUMBER		
NOTIFICATION DATE 08/13/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/500,362

Applicant(s)

HASSKERL ET AL.

Examiner

Elizabeth Robinson

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21, 23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) 17-21, 23 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-16 are currently being examined.

Claim Rejections - 35 USC § 103

Claims 1-13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5,385,988).

Regarding claim 1, Yamamoto (Column 17, line 46 through Column 18, line 29, Example 26) teaches an example composition comprising vinyltrimethoxy silane, water, hydrochloric acid, hydroxyethyl methacrylate, and methyl methacrylate. Vinyltrimethoxy silane meets the structural limitations of silicon compound A) of the instant application with R¹ being vinyl (an alkenyl with 2 carbons), X being methoxy (an alkoxy with 1 carbons), m=1, n=1, o=0, r=0, and s=3. Hydroxyethyl methacrylate meets the structural limitations of compound D) of the instant application with R³ being a methyl group and R⁴ being an aliphatic radical with 2 carbon atoms having a hydroxy group. Methyl methacrylate meets the structural limitations of compound E) of the instant application. In claim 1 of the instant application, the only components which must be present are A, B, C, D and E. Component F can be present at 0 parts by weight of the composition. Example 26 (Columns 17 and 18) teaches that the silicon compound, the acid and the water are reacted first and then the methacrylates are added. The relative proportions

of vinyltrimethoxy silane, acid, water and hydroxyethyl methacrylate meet the proportions of the instant claim.

Yamamoto does not explicitly teach that the hydrolysis is complete and the amount of methyl methacrylate added to the composition.

Degree of hydrolysis

The reaction of the silicon compound, acid and water is conducted at an elevated temperature, in the presence of the acid catalyst over a prolonged time period (Example 26 and Column 6, lines 28-49). The conditions for the hydrolysis of the silicon compound (time, temperature, catalyst) can be the same as in the instant application and thus, the degree of hydrolysis would inherently be the same as in the instant application.

Amount of Methyl Methacrylate in the composition

Yamamoto (Column 7, lines 30 through 39) teaches that the radical-polymerizable vinyl compound (the methacrylates) is present in a range of 1 to 99% by weight of the composition and that the silane compound is present in a range of 99 to 1% of the composition. Yamamoto (Column 1, lines 44-50) further teaches that the relative proportions of the silicon compound and the acrylic resin determine the properties of the composite composition such as rigidity, transparency, toughness and workability.

The composition of Example 26 of Yamamoto either meets the proportions of the instant claim or alternately it would be obvious to one of ordinary skill in the art to vary

the proportion of the methyl methacrylate to obtain a composite material with a desired level of transparence and workability. There is sufficient range of adjustability of the silane to methacrylate compounds to meet the relative proportions of the compounds.

Regarding claim 2, vinyltrimethoxy silane (of Example 26) meets the limitations of the silicon compound of formula (Ia) of the instant claim with R^1 being vinyl (an alkenyl with 2 carbons), X being methoxy (an alkoxy with 1 carbons), $n=1$, and $s=3$.

Regarding claim 3, Yamamoto (Column 5, lines 49-52) teaches that the silicon compound can be a combination of a silane compound of formula (II) and a silane compound of any of formulas (IV) to formula (VII). A combination of a formula (II) compound and a formula (V) compound meets the limitations of the instant claim. For example, ethyltrimethoxysilane is a formula (II) compound that meets formula (Ib) of the instant application with R^2 being an alkyl with 2 carbons, X being methoxy (an alkoxy with 1 carbons), $o=1$ and $s=3$. Vinyltrimethoxysilane is a formula (V) compound that meets formula (Ia) of the instant application with R^1 being an alkenyl with 2 carbons, X being methoxy (an alkoxy with 1 carbons), $n=1$ and $s=3$.

Regarding claim 4, vinyltrimethoxy silane meets the limitations of the silicon compound of formula (Ic) of the instant claim with R^1 being vinyl (an alkenyl with 2 carbons), and X being methoxy (an alkoxy with 1 carbons).

Regarding claims 5 and 6, Yamamoto (Column 3, line 46 through Column 4, line 7) teaches that the preferred silane compounds meet one of the formulas (II) through

(VIII). γ -Methacryloxypropyltriethoxysilane is a silane compound of formula (IV) with R^7 being a methyl group, $p=3$, $n=0$, and R^6 being a hydrocarbon radical of 2 carbon atoms.

Regarding claim 7, Yamamoto (Column 6, lines 43-49) teaches that the hydrolysis of the silane compound is carried out at a temperature ranging from room temperature ($\sim 20^\circ\text{C}$) to 120°C . This range overlaps the range of the instant claim. In Example 26 (Columns 17 and 18), the reaction is carried out at 70°C .

Regarding claim 8, Yamamoto (Column 6, lines 39-41) teaches that the reactant is dissolved homogeneously in the hydrolysis reaction.

Regarding claim 9, Yamamoto (Column 6, lines 43-49) teaches that the hydrolysis of the silane compound is carried out for a period of about 30 minutes to about 24 hours. This range is fully encompassed by the range of the instant claim.

Regarding claim 10, as stated above, Yamamoto (Example 26, Columns 17 and 18) teaches hydroxyethyl methacrylate (a hydroxyalkyl (meth)acrylate) as one of the two methacrylates of the composition.

Regarding claim 11, Yamamoto (Column 2, lines 16-50) teaches that there can be more than one methacrylate as the radical polymerizable vinyl compound. Yamamoto further teaches glycidyl methacrylate as one of the useful monomers.

Regarding claims 12 and 13, as stated above, Yamamoto (Example 26, Columns 17 and 18) teaches methyl methacrylate (ethylenically unsaturated monomers) as one of the two methacrylates of the composition. This meets the limitation of formula (III) of

claim 12 with R³ being a methyl group and R⁵ being an aliphatic radical with 1 carbon. Methyl methacrylate is 100% of component E.

Regarding claim 16, Yamamoto (Example 26, Columns 17 and 18) teaches adding 0.15 parts by weight of AIBN (the same free-radical polymerization initiator as is preferred in the instant case).

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5,385,988), in view of Owens (US 3,793,402).

Regarding claim 14, as stated above Yamamoto teaches a composition that meets or can be obviously modified to meet the limitations of claim 1, since compound F can be present at 0 parts per weight. The composition contains a large percentage of monomer E, which as taught above, can be methyl methacrylate. Yamamoto (Column 21, lines 55-60) further teaches that the composite compositions are useful as windowpanes.

Yamamoto does not teach adding impact modifiers to the composition.

Owens (Column 1, lines 27-66) teaches adding impact modifiers to rigid thermoplastic polymer compositions, which are useful as glazing material, in order to improve the impact resistance of the rigid materials. Owens (Column 11, lines 35-51) further teaches that the rigid thermoplastics are copolymers that contain 50 to 100% of an alkyl methacrylate monomer, preferably methyl methacrylate. The impact modifiers comprise polymerized methyl methacrylate (Column 12, lines 44-48) and are thus, a copolymer of monomer E.

It would be obvious to one of ordinary skill in the art to add the impact modifiers of Owens, to the composition of Yamamoto, to improve the impact resistance of the methyl methacrylate copolymer glazing/windowpane composition.

Regarding claim 15, Owens (Column 2, lines 1-58) teaches that the impact modifiers can be added at about 4 to 90 wt% of the impact modifier/rigid thermoplastic composition. Owens (Column 10, lines 30-73) further teaches that an emulsion of the impact modifier (referred to as the multi-stage polymer) can be added to the rigid thermoplastic monomer mix, in order to yield the desired rigid thermoplastic polymer. The outer layer of the impact modifier is preferably made from methyl methacrylate (Column 8, lines 63-73) and thus, the emulsion would contain methyl methacrylate as compound F. The amount and composition of the impact modifier emulsion would be a results effective variable that would determine the impact strength of the rigid thermoplastic polymer.

Owens does not explicitly teach the amount of the polymer in the emulsion.

It would be obvious to one of ordinary skill in the art to vary the amount and composition of the emulsion to meet a desired level of impact strength for the rigid thermoplastic composition.

Response to Arguments

Applicant's arguments filed June 5, 2009 have been fully considered but they are not persuasive.

Applicant argues that the Yamamoto et al. (US 5,385,988) does not react components A and B with an acid. As stated above, and previously stated in the March 5, 2009 Office Action, the Example compositions teach reacting with an acid catalyst.

Applicant argues that the Examiner stated that the hydrolysis of the Yamamoto would inherently be the same as that of the instant application. That is not the case. The Examiner stated that the degree of hydrolysis would inherently be the same. As stated above, and in the previous Office Action, the time, acid concentration and temperature during hydrolysis would result in the same degree of hydrolysis as in the instant application.

Applicant argues that not all of the alkoxy groups of Yamamoto are hydrolyzed, and points to this as saying hydrolysis is not complete. However, the section of the instant specification used in this amendment (Page 15, lines 10-32) does not teach that all of the groups are hydrolyzed, but rather that there has been sufficient time for the reaction to proceed. Further, as was stated in the previous Office Action and not addressed by Applicant, on page 14, lines 6-21, the instant specification teaches that the product of reaction a) cannot be specified completely and that it is assumed that the silicon compound is to some extent hydrolyzed. Thus, the instant specification does not teach that complete hydrolysis means that all alkoxy groups are hydrolyzed, but rather that the reaction has sufficient time, temperature and catalysis to reach to a desired degree of completion.

Applicant points out that Comparative Example 1, of the instant application, is not hydrolyzed at all and has inferior properties. This does not show that a partially hydrolyzed product would have inferior properties.

Applicant argues that the fact that all the water in the composition has disappeared shows that the amount of water in the instant application is always used in excess compared to the silicon compound. However, the disappearance of the water shows the exact opposite. If there was excess water, there would still be water present after hydrolysis was complete. The lack of water appears to mean that "complete hydrolysis" is achieved when all of the available water has been used, not that all the alkoxy groups are hydrolyzed.

Applicant argues that Yamamoto does not specifically suggest the compound of instant claims 5 and 6. First, regarding claim 5, the current and previous Office Actions state that Yamamoto teaches that the preferred silane compounds meet one of the formulas (II) through (VII). These compounds include specific disclosure of γ -methacryloyloxypropyltrimethoxysilane and vinyltriethoxysilane. Regarding claim 6, as stated by Applicant, compounds of formula (IV) encompass the claimed specific compound. Further, while Yamamoto does not specifically disclose γ -methacryloyloxypropyltriethoxysilane, Yamamoto does specifically disclose γ -methacryloyloxypropyltrimethoxysilane. This compound is a homolog of γ -methacryloyloxypropyltriethoxysilane. Compounds which are position isomers (compounds having the same radicals in physically different positions on the same nucleus) or homologs (compounds differing regularly by the successive addition of the same

chemical group, e.g., by -CH₂- groups) are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). See also *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978) (stereoisomers *prima facie* obvious). In light of the cited case law, it therefore would have been obvious to one of ordinary skill in the art that the compound disclosed in the present claims is but an obvious variant of the compound disclosed in Yamamoto.

In response to Applicant's arguments that the compositions of the instant application and of Yamamoto are not identical and Applicant's allegation that the Examiner asserted that the composition Yamamoto and the instant application are the same, the following passage from Page 7 of the February 12, 2008 Office Action is reprinted:

"Applicant argues that the composition of Yamamoto is not a polymerizable composition, but rather a composite composition. However, the composite composition is formed after the polymerizable composition is polymerized (Abstract and Example 26). Thus, prior to polymerization the composition is a polymerizable composition. As stated in this Office Action and the August 9, 2007 Office Action the composition of Yamamoto either meets or can be obviously modified to meet the limitations of Claim 1. Applicant has provided no data to show that the polymerizable composition of Yamamoto does not meet the limitations of claim 1."

As can be seen from this passage, the Examiner did not state that the compositions are the same, but rather that the composition of Yamamoto meets or can be obviously modified to meet the limitations of the instant claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is (571)272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. R./
Elizabeth Robinson
Examiner, Art Unit 1794

August 7, 2009

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794